



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/963,351	09/25/2001	Syed Abbas	21676-05433	8268
758	7590	04/04/2005	EXAMINER	
FENWICK & WEST LLP SILICON VALLEY CENTER 801 CALIFORNIA STREET MOUNTAIN VIEW, CA 94041			CHANG, EDITH M	
			ART UNIT	PAPER NUMBER
			2637	

DATE MAILED: 04/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/963,351

Applicant(s)

ABBAS ET AL.

Examiner

Edith M Chang

Art Unit

2637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 September 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-53 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 20020222, 20020903.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 1-13 are objected to because of the following informalities:

Claim 1, line 2: "comprising" is suggested changing to "comprising the steps of".

Claim 12, line 3: "its" is suggested changing to "an".

Claims 2-11 and 13 are dependent on the rejected claim 1.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 25 and 38-52 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The claims 38, 44, 50, 51 are a single mean claims.

A single means claim, i.e., where a means recitation does not appear in combination with another recited element of means, is subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph. In re Hyatt, 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983) (A single means claim which covered every conceivable means for achieving the stated purpose was

Art Unit: 2637

held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor.). When claims depend on a recited property, a fact situation comparable to Hyatt is possible, where the claim covers every conceivable structure (means) for achieving the stated property (result) while the specification discloses at most only those known to the inventor.

Claim 25, the limitation can not be made when there is no “one bit capacity subchannel allowed or available in *the multicarrier communication system*”, since “the signal point reserved for signaling is associated with a subchannel having a one bit capacity” can be made only when there is a “one bit capacity subchannel allowed or available in *the multicarrier communication system*”. Wherein the multicarrier communication system is DMT of the ADSL modem taught in the specification.

Claim 52, the limitation can not be made when there is no “1-bit capacity subchannel allowed or available in *the multicarrier communication system*”, since “a 1-bit subchannel as reserved for signaling” can be made only when there is a “1-bit capacity subchannel allowed or available in *the multicarrier communication system*”. Wherein the multicarrier communication system is DMT of the ADSL modem taught in the specification.

Claims 39-43 and 45-49 are directly or indirectly dependent on the rejected claims 38 and 44.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 2637

4. Claims 1-31, 36 and 41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, line 5: "the signal point being reserved" does not clearly indicate it is the "an active state signal point" recited in line 4 or other one signal point.

Claim 11, line 2: Claim 12, line 2: "the signal point" does not clearly indicate what is the signal point, what is the antecedence of the signal point.

Claim 14, line 5; Claim 22 line 2: "its inversion" does not clearly indicate which's inversion.

Claim 19, lines 1-2: "The method of claim 14 wherein in response to determining that there is no event or control function to signal" is indefinite that in claim 14 does not recite the step of "in response to determining that there is no event or control function to signal".

Claim 23, line 4: "its active state" does not clearly indicate which's active state.

Claim 29, lines 1-2: "the method of claim 28 wherein bit loading assignment and bit swapping algorithms associated with the multicarrier communication system" recites the assignment and the algorithms, and does not clearly indicate what are the assignment and the algorithms, since the method of claim 28 wherein there is no bit loading assignment and bit swapping algorithms cited.

Claim 36, line 2: "every superframe" lacks antecedent basis.

Claim 41, lines 1-2: "the method of claim 40 wherein bit loading assignment and bit swapping algorithms associated with the multicarrier communication system" recites the assignment and the algorithms, and does not clearly indicate what are the assignment and the

Art Unit: 2637

algorithms, since the method of claim 40 wherein there is no bit loading assignment and bit swapping algorithms cited.

Claims 2-10, 12-13, 15-18, 20-22, 24-28 and 30-31 are directly or indirectly dependent on the rejected claims 1, 14 and 23.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

6. Claims 1-6, 13, 23-24, 26-27, 31-35, 38-39, and 50-51 are rejected under 35 U.S.C. 102(a) as being anticipate by admitted prior art (Admission).

Regarding to **claims 1 & 38**, Admission discloses a modem and its method for signaling an event or control function in a multicarrier communication system (paragraph 0004 lines 1-6 & paragraph 0007 lines 1-2 of BACKGROUND OF THE INVENTION of the current specification) comprising:

determining that modulation parameter changes must be signaled (paragraph 0008 lines 1-2 Admission); encoding a sync symbol inversion in a constellation associated with a subchannel (paragraph 0004 lines 5-8) by an encoder, the constellation point of the sync symbol inversion is the active state signal point reserved for signaling purpose (active to inform the parameters change, paragraph 0008, lines 1-3, wherein the sync symbol inversion used for signaling); and

transmitting the encoded sync symbol inversion constellation point to signal the parameter change during data mode (paragraph 0005 lines 1-6, wherein the bit swapping of parameter changes performs during data mode after initialization).

Regarding to **claims 2 & 3**, Admission teaches the DMT system of the ADSL transceiver (paragraph 0003) which can be implemented in software by DSP technology, this is a well-known implementation technology.

Regarding to **claims 4-5 & 26**, Admission teaches each signal constellation modulated onto the corresponding subchannel (paragraph 0004 lines 5-10) wherein each signal constellation has one bit or more than one bits modulated onto the corresponding subchannels. Hence the subchannel has a one bit capacity or a bit capacity of more than one bits assigned to a latency path (paragraph 0006 lines 6-12).

Regarding to **claims 6, 27 & 39**, Admission teaches the signal points in the signal constellation being established associated with each corresponding subchannels during an initialization before the data mode (paragraph 0004 lines 5-10, wherein the constellation assigned before transmitting).

Regarding to **claim 13**, Admission teaches that the signaled event or control function takes effect after the signaling being transmitted and received to implement the action accordingly (paragraph 0005 lines 7-8, 0006 lines 1-2) that requires a predetermined turn around period by the characteristic of the DMT ADSL modems to perform the bit swapping to maintain the quality of the transmission link.

Regarding to **claims 23, 24, 31 & 50**, Admission teaches the ADSL modem and its method to signal event or control function via the sync symbol inversion constellation signal

Art Unit: 2637

point (paragraph 0004 lines 5-8, wherein the signaling constellation point is modulated onto the corresponding subchannels) in a DMT system (paragraph 0004 lines 1-4), comprising a decoder to decode the receive symbols (paragraph 0005 lines 3-8, wherein the modulated signaling point, such as used in the bit swapping technique, is transmitted, received, and decoded); to adjusting parameters (paragraph 0005 lines 1-6 & paragraph 0006 lines 1-2, wherein the SNR profiles and rate/bandwidth partitioning are configuration parameters) to take effect after the signaling being transmitted, received, and decoded by a decoder to implement the action accordingly (paragraph 0005 lines 7-8, 0006 lines 1-2, wherein the actions are performed continuously and dynamically) that requires a predetermined turn around period by the DMT ADSL modems.

Regarding to **claims 32 & 33**, Admission teaches the signaled event or control function takes effect after the sync symbol inversion (paragraph 0008 lines 1-3, wherein the sync symbol is the distinct signaling symbol) being transmitted, received and decoded by a decoder to implement the action accordingly to adjust the parameters (paragraph 0005 lines 3-8 wherein the bit swapping is an action to adjust the SNR profiles, or 0006 lines 1-2) that requires a predetermined turn around period by the DMT ADSL modems to encode and decode the signaling to perform the bit swapping or dynamic rate repartitioning to maintain the quality of the transmission link (paragraph 0005 lines 7-8 & paragraph 0006 lines 1-2, wherein the bit swapping/rate partitioning is performed continuously and dynamically).

Regarding to **claims 34 & 35**, Admission teaches the sync symbol inversion signaling being established during an initialization before the data mode (paragraph 0004 lines 4-8 & paragraph 0008 lines 1-3, wherein the constellation is assigned to the distinct signaling before



Art Unit: 2637

transmitting). The distinct symbol associates with the symbol data pattern is a sync symbol with its sync data pattern.

Regarding to **claim 51**, Admission teaches the modem and its method comprising a decoder to decode a sync symbol inversion (paragraph 0005 lines 3-8, wherein the modulated signaling point, such as used in the bit swapping technique, is transmitted, received, and decoded) having the data pattern reserved for signaling (paragraph 008 lines 2-3, wherein the sync symbol inversion is the distinct signaling symbol having a data pattern reserved for signaling) that received by the modem to take effect of the function of the signaling (paragraph 0005 lines 7-8, 0006 lines 1-2).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 7-10, 28-30 and 40-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art (Admission) in view of Matsumoto (US 6,747,992 B1).

Regarding to **claims 7-8, 28-29 & 40-41**, Admission does not specify assigning the data symbol to a pre-established replacement signal point. However in FIG.19 & FIG.20 and Abstract, Matsumoto teaches the second data (as the sync symbols, S in FIG.19 & SS in FIG.20) multiplexed with the first data (as the data symbols, symbols A & B in FIG.19 or bitmap A & B in FIG.20) wherein the bits are assigned in such a manner that the second data is transmitted in a predetermined time (S in FIG.19), and the sync symbols are assigned to signal points (column 5

Art Unit: 2637

lines 12-27, wherein the S sync symbol is assigned accordingly, S FIG.19 or SS FIG.20), and data symbols are assigned to the pre-established replacement signal points (column 5 lines 27-45, wherein the bitmap A is assigned). As Matsumoto's system and method for parameter changing (rate converting, column 6 lines 7-11), at the time of invention was made, it would have been obvious to a one of ordinary skill in the art to assign the data symbols from a pre-established replacement signal points taught by Matsumoto to avoid assigning symbol of a given period (such as the S sync symbol) assigned to a subsequent period (to the data symbol), so the changing of the bit distribution (for rate converting, the bit distribution of rate converting is bit loading assignment and bit swapping taught in the Admission) have the purpose of suppressing the delay (column 6 lines 17-25).

Regarding to **claims 9 & 42** the system and method modified with Matsumoto's teaching discloses the error correction techniques (FIG.17 blocks 151 & 152 for error correction).

Regarding to **claims 10, 30 & 43**, Admission taught the bit distribution (including the pre-established replacement signal point for data symbol) is established during an initialization (paragraph 0004 lines 5-10, wherein the constellation assigned before transmitting).

9. Claims 11-12, 14-22, 36-37, and 44-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art (Admission) in view of Tzannes (US 6,498,808 B1).

Regarding to **claims 11-12, 19, 21, 36 & 48**, Tzannes details the sync symbol transmitted every 69 symbols (the super frame), hence the sync symbol is encoded Regarding to the ANSI and ITU standards even when there is no event or control function assigned to the signal (no

Art Unit: 2637

parameters change in an inactive state), when the sync symbol is assigned to a event or control function, the sync symbol is in an active state to signaling.

Regarding to **claims 14 & 44**, Admission discloses a modem and its method for signaling an event or control function in a multicarrier communication system (paragraph 0007 lines 1-2 Admission) comprising:

Determining that modulation parameter changes must be signaled (paragraph 0008 lines 1-2 Admission); encoding a sync symbol inversion which is associated with a sync symbol producing the encoded sync symbol inversion (paragraph 0008 lines 2-3) by an encoder; and

Transmitting the encoded sync symbol inversion to signal the parameter change during data mode (paragraph 0005 lines 1-6, wherein the bit swapping of parameter changes performs during data mode after initialization).

However, Tzannes details the well-known sync symbol in column 15 lines 10-25. The sync symbol (first symbol data pattern) is constructed by modulated using a predefined PN sequence (the PN sequence is a data pattern). As the Admission using the DMT sync symbol, at the time of invention was made, it would have been obvious to a one of ordinary skill in the art to construct the sync symbol taught by Tzannes to have an uneasy corrupted signaling signal and a robust signaling (column 15 lines 5-9 & 22-24).

Regarding to **claims 15 & 16**, Admission teaches the DMT system of the ADSL transceiver which can be implemented in software by DSP technology (paragraph 0003), this is a well-known implementation technology.

Regarding to **claims 17-18 & 45-46**, Admission teaches transmitting the encoded sync symbol inversion to signal the parameter change during data mode wherein the sync symbol

inversion needs to be associated with the event or control function before the transmitting (paragraph 0005 lines 1-6, wherein the bit swapping of parameter changes performs during data mode after initialization). The symbol associates with the first symbol data pattern is a sync symbol with its sync data pattern.

Regarding to **claims 20 & 47**, Admission teaches the signaled event or control function takes effect after the signaling being transmitted and received to implement the action accordingly (paragraph 0005 lines 7-8, 0006 lines 1-2) that requires a predetermined turn around period by the characteristic of the DMT ADSL modems.

Regarding to **claims 22, 37 & 49**, Tzannes details the well-known sync symbol in column 15 lines 18-21. The sync symbol (first symbol data pattern) and its inversion is constructed by modulated using a predefined PN sequence (the PN sequence is a data pattern) being shifted to achieve the special autocorrelation properties that make detection the sync and its inversion possible in a noisy environments (column 15 lines 15-18).

10. Claims 25, 52 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art (Admission).

Regarding **claims 25, 52 & 53**, Admission teaches the method comprising determining the bit capacity of each subchannel in the DMT system (paragraph 0004); and the subchannel with higher SNR is assigned to data with more bits (paragraph 0004 lines 4-5), and subchannel with lower SNR having less dense constellation (fewer bits) is assigned to the reserved signaling (represented by constellation point in coding) which has less information than the data (paragraph 0004 lines 4-6), and it is well known that at least one bit of a subchannel during a specified frame may be employed as a “signaling” or “line signal” bit which may be used to

Art Unit: 2637

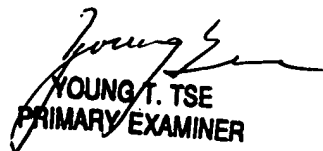
control the subchannel. At the time of the invention, it would have been obvious to a one of ordinary skill in the art to associated the least bit 1-bit of the less information (or the less dense constellation) subchannel to the signaling bit in the frame.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M Chang whose telephone number is 571-272-3041. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayanti Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Edith Chang  
March 22, 2005

  
YOUNG T. TSE  
PRIMARY EXAMINER